



What is claimed is:

1. An image signal processor for processing a plurality of image signals, comprising:

5       an image memory circuit for storing a signal corresponding to a target pixel and signals corresponding to a plurality of peripheral pixels adjacent to the target pixel;

10       a deficiency candidate detection circuit, connected to the image memory circuit, for comparing the signal of the target pixel with a threshold value set in accordance with the signals of the plurality of peripheral pixels to detect a deficient pixel candidate;

15       a deficiency determining circuit, connected to the deficiency candidate detection circuit, for determining a deficient pixel according to continuity of the deficient pixel candidate, detected by the deficiency candidate detection circuit, over a plurality of screens;

20       a position memory circuit, connected to the deficiency determining circuit, for storing deficiency information of a position of the deficient pixel determined by the deficiency determining circuit; and

25       a deficiency correction circuit, connected to the position memory circuit, for correcting the signal of the target pixel which is deficient in accordance with the deficiency information.

30       2. The image signal processor according to claim 1, wherein the deficiency candidate detection circuit computes a difference between a maximum level and a minimum level of the signals of the plurality of peripheral pixels, producing a first threshold value by adding the difference to an average level of the signals of the plurality of peripheral

pixels and producing a second threshold value by subtracting the difference from the average level.

3. The image signal processor according to claim 2,  
5 wherein the deficiency candidate detection circuit produces each of the first and second threshold values in a form of a plurality of sub-threshold values, and detects a deficient pixel candidate by using the sub-threshold values.

10 4. The image signal processor according to claim 3, wherein the deficiency determining circuit performs a deficiency determining operation continuously over a plurality of fields to determine a position of a deficient pixel and stops operating together with the deficiency  
15 candidate detection circuit.

5. The image signal processor according to claim 4,  
wherein the deficiency determining circuit repeats the deficiency determining operation in a predetermined cycle.

20 6. The image signal processor according to claim 1, wherein the position memory circuit includes:

a first memory for temporarily storing position  
information of the deficient pixel together with a result of  
25 detection by the deficiency candidate detection circuit; and  
a non-volatile second memory for storing the position  
information of the deficient pixel read from the first  
memory.

30 7. The image signal processor according to claim 1, wherein the deficiency determining circuit receives image pickup control information from an image pickup device for producing the image signal and determines a deficient pixel

by using the image pickup control information and the threshold value.

5        8. The image signal processor according to claim 7,  
wherein the deficiency determining circuit receives the image pickup control information from the image pickup device, estimates a luminance of a subject from the image pickup control information, and determines a deficient pixel by using the threshold value when the estimated luminance of  
10       the subject lies within a predetermined range.

      9. The image signal processor according to claim 1,  
wherein the deficiency determining circuit determines a deficient pixel for each of a plurality of segmental areas  
15       of one screen.

      10. The image signal processor according to claim 9,  
wherein the deficiency determining circuit determines a deficient pixel repeatedly in a time division multiplexed  
20       manner for each of the plurality of segmental areas of one screen.

      11. The image signal processor according to claim 1,  
wherein at least one of the deficiency determining circuit and the correction information memory circuit is connected  
25       to an external unit via a bus and a determination condition for a deficient pixel including the threshold value is altered by the external unit.

30       12. A method of detecting a deficient pixel in a plurality of pixels, comprising the steps of:

      detecting a deficient pixel candidate by comparing a signal of a target pixel with a threshold value set in

accordance with signals of a plurality of peripheral pixels adjacent to the target pixel;

storing a position of the detected deficient pixel candidate;

5       recomparing a signal of that target pixel which corresponds to the position stored in the position storing step with the threshold value;

storing a comparison result of the recomparing step;

repeating the recomparing step and the comparison  
10       result storing step a predetermined number of times; and

detecting a deficient pixel in accordance with a plurality of comparison results obtained by the repeating step.

15       13. The method according to claim 12, wherein the deficient-pixel-candidate detecting step includes:

computing an average level from the signals of the plurality of peripheral pixels adjacent to the target pixel;

20       detecting a maximum level and a minimum level from the signals of the plurality of peripheral pixels;

computing a difference between the maximum level and the minimum level; and

25       setting a threshold value by adding the difference to the average level or subtracting the difference from the average level.

14. The method according to claim 13, further comprising the step of performing a correction on an image signal of the detected deficient pixel and producing a  
30       deficiency-corrected image signal.

15. The method according to claim 12, wherein the deficient-pixel detecting step detects a deficient pixel in

accordance with a plurality of comparison results and an image pickup condition for producing image signals.

16. A method of detecting a deficient pixel in a plurality of pixels, comprising the steps of:

detecting a first deficient pixel candidate by comparing a signal of a target pixel with a threshold value set in accordance with signals of a plurality of peripheral pixels adjacent to the target pixel;

storing a position of the first deficient pixel candidate;

detecting a second deficient pixel candidate by comparing a signal of the target pixel with the threshold value;

determining if a position of the first deficient pixel candidate coincides with a position of the second deficient pixel candidate;

updating information of the stored position of the first deficient pixel candidate in such a way that only position information of that first deficient pixel candidate which has been determined to have a match in the coincidence determining step remains;

repeating the second-deficient-pixel-candidate detecting step, the coincidence determining step and the updating step by a predetermined number of times; and

detecting a deficient pixel in accordance with position information of deficient pixel candidates acquired by the repeating step.

17. The method according to claim 16, wherein the step of detecting the first and second deficient pixel candidates includes:

computing an average level from the signals of the

plurality of peripheral pixels adjacent to the target pixel;

detecting a maximum level and a minimum level from the signals of the plurality of peripheral pixels;

5        computing a difference between the maximum level and the minimum level; and

setting a threshold value by adding the difference to the average level or subtracting the difference from the average level.

10        18. The method according to claim 17, further comprising the step of performing correction on an image signal of the detected deficient pixel and producing a deficiency-corrected image signal.